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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/659,949

09/11/2003

Hussein I. Hanafi

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EXAMINER

TOLEDO, FERNANDO L

SCULLY SCOTT MURPHY & PRESSER, PC

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GARDEN CITY, NY 11530

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 04/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,949

Applicant(s)

HANAFI ET AL.

hm

Examiner

Fernando L. Toledo

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 14, 15 and 17 – 22 are rejected under 35 U.S.C. 102(e) as being unpatentable over Lopatin et al. (U. S. Patent 6,500,743 B1) in view of Cappellani et al. (US Patent Application Publication US 20040157380 A1).
3. In re claims 14 and 19 – 22, Lopatin, in the U. S. Patent 6,500,743; figures 1 – 24 and related text, discloses a Si-containing substrate 102 including at least one device channel/body implant region 1302 separating a source region from a drain region, the at least one device channel/body implant region having a length of less than about 1.0 μm ; a gate dielectric located at least atop the device channel/implant body region, the source region and the drain region (Column 3, Lines 55 – 67); a T-gate located atop a portion of the gate dielectric, said T-gate includes a recessed bottom polysilicon region 104 and an upper gate conductor region 2402, the upper gate conductor region has a width that is greater than a width of the bottom polysilicon region (Figure 24); and nitride spacers 1802 located on exposed vertical sidewalls of the bottom polysilicon region, the nitride spacers have an outer edge that is aligned with an outer edge of the upper gate conductor region (Figure 24).

Lopatin does not disclose wherein the upper gate conductor is tungsten, aluminum or titanium.

However, Cappellani, in the US Patent Application Publication US 2004/0157380 A1; figures 1 – 3 and related text, discloses that the upper gate has to have a higher electrical conductivity than that of polysilicon to increase the overall conductivity of the gate in the case of very small dimensions in which case it should be composed of metal, in particular tungsten (§ 0033, 0043 and 0045).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the upper gate of Lopatin out of tungsten, since as taught by Cappellani, the second gate must have a higher electrical conductivity than polysilicon and should be made of metal, like tungsten.

4. In re claim 15, Lopatin discloses wherein the gate dielectric is an oxide having a dielectric constant of about 3.0 or greater (Column 3, Lines 55 – 67).

5. In re claim 17, Lopatin discloses wherein the upper gate conductor is composed of polysilicon, a conductive metal, a silicide or a combination thereof (Column 8, Lines 1 – 3).

6. In re claim 18, Lopatin discloses wherein the upper gate conductor is composed of a conductive metal (Column 8, Lines 1 – 3).

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lopatin in view of Cappellani as applied to claims 14, 15 and 17 – 22 above, and further in view of Subramanian et al. (U. S. Patent 7,008,832 B1).

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8. Lopatin in view of Cappellani does not disclose wherein the substrate is a silicon-on-insulator substrate. Lopatin discloses it can be a silicon substrate or any other substrate used in IC technology.

However, Subramanian, in the U. S. Patent 7,008,832 B1; figures 1 – 9 and related text discloses that a T-gate transistor can be formed in any substrate used in IC technology such as a silicon-on-insulator substrate (Column 3, Lines 45 – 53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a SOI substrate in the invention of Lopatin in view of Cappellani, since as taught by Subramanian, T-gate transistors can be made in any substrate used in IC technology, including SOI substrates.

Response to Arguments

9. Applicant's arguments with respect to claims 14 – 22 have been considered but are moot in view of the new ground(s) of rejection.

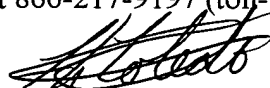
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando L. Toledo whose telephone number is 571-272-1867. The examiner can normally be reached on Mon-Fri 12pm-7:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Fernando L. Toledo
Patent Examiner
Art Unit 2823

flt
28 March 2006